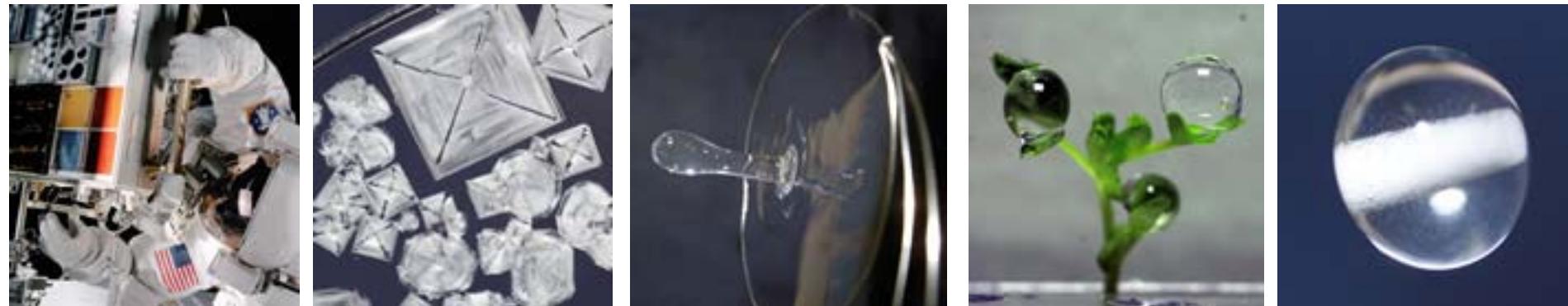




INTERNATIONAL SPACE STATION



MISSION INTEGRATION OVERVIEW



Agenda

- ◆ Introduction
- ◆ Payload Integration Manager (PIM)
- ◆ ISS Payload Integration Process
- ◆ Integration Timeframes
 - Strategic, Tactical, and Operations
- ◆ Documentation
 - Joint Agreements, Integration Products
- ◆ Getting Manifested!
- ◆ Payload Tactical Plan
- ◆ Change Evaluation Process
- ◆ Summary



Introduction

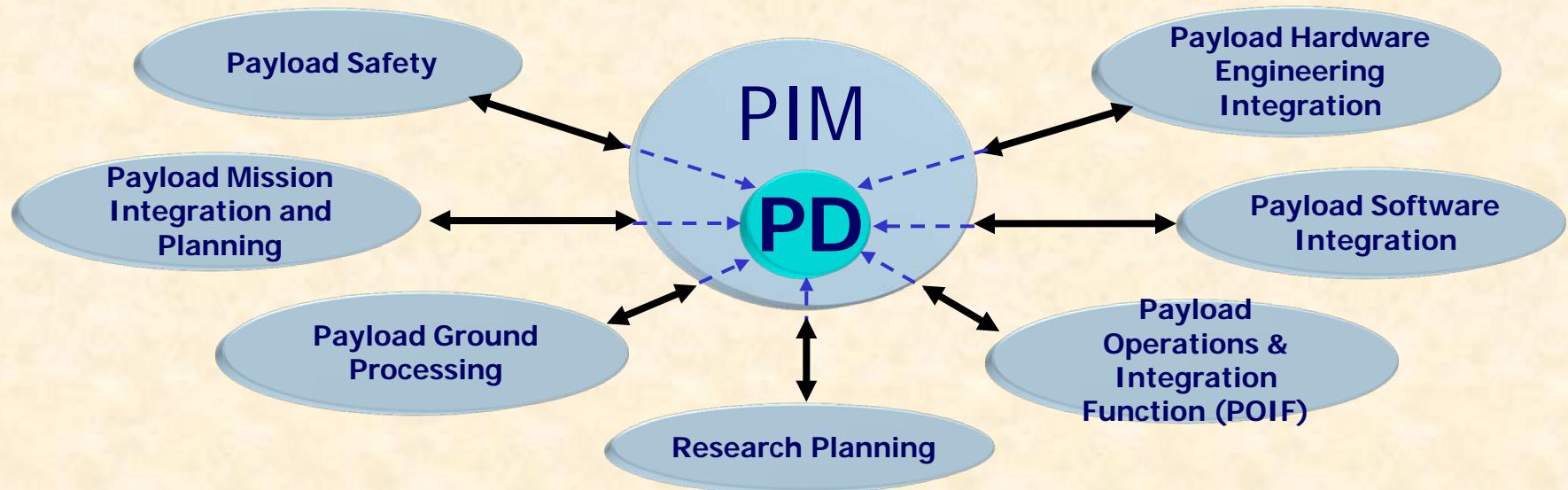
This briefing provides a basic understanding of the ISS Payload Integration Process, including ISS-provided support to the payload and payload-provided data for the ISS



Payload Integration Manager

◆ NASA Payload Integration Manager (PIM)

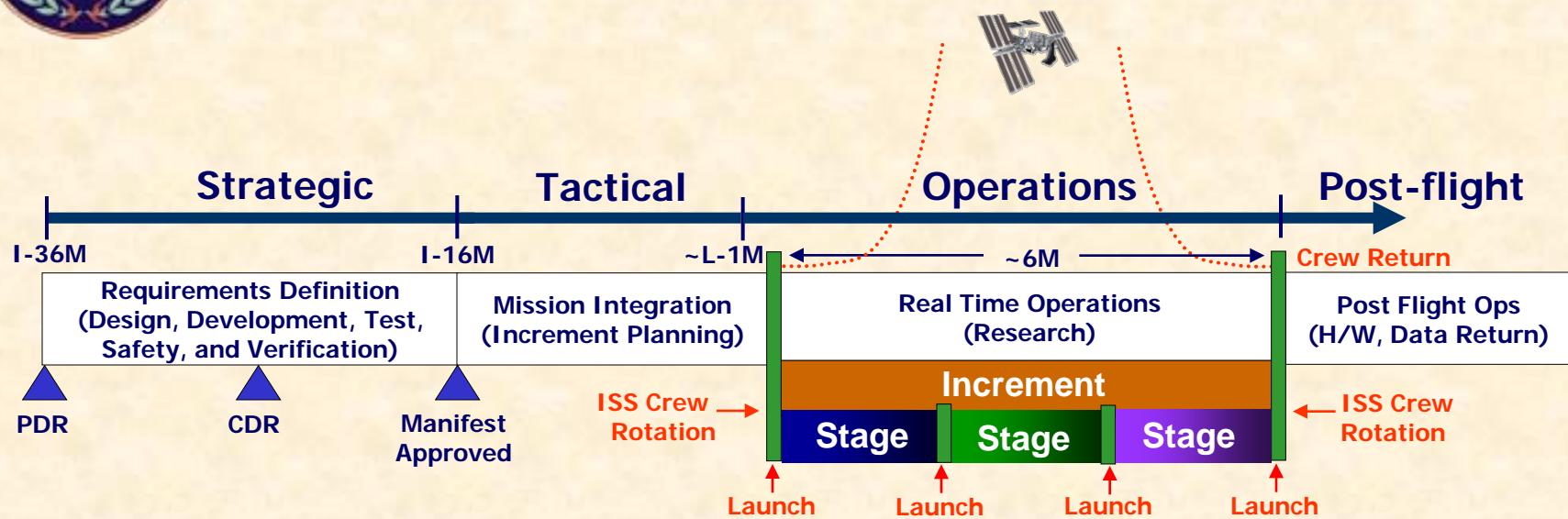
- Functions as the Payload Developer's primary interface to the ISS Program
- Serves as payload advocate – but also protects ISS Program Requirements



- Ensures payload requirements are accurately defined and documented
- Facilitates payload integration product development, delivery schedules, and communications with the ISS Program



ISS Payload Integration Process

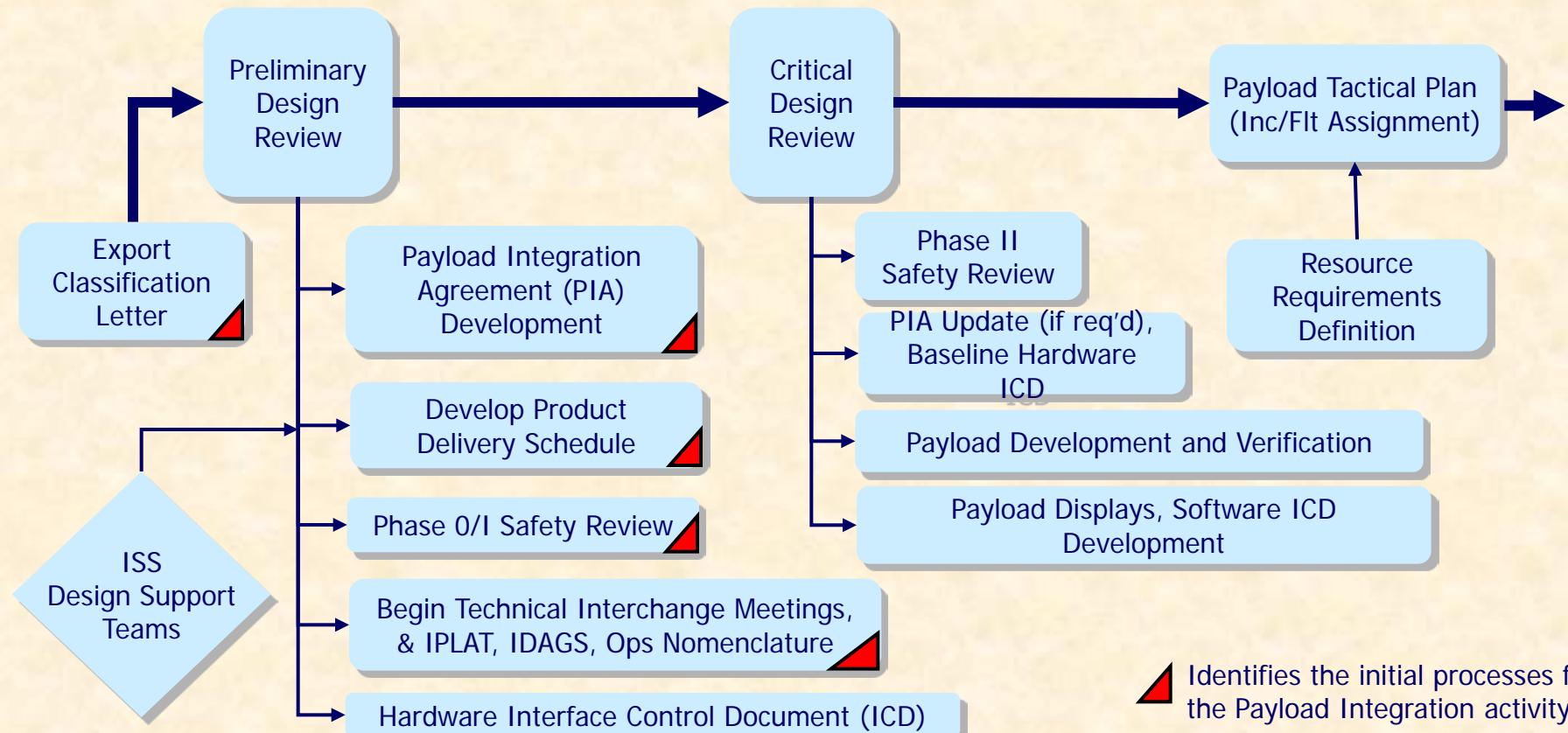


- **NASA PIMs provide integration leadership during all phases of the payload's life cycle**
 - **Strategic** – ISS integration requirements, products, and schedule development to ensure that an ISS compatible payload is built; support manifest process (payload data collection and feasibility assessments)
 - **Tactical** – represent PD interests to Increment and Flight-specific teams to ensure that integration and operations requirements are addressed; provide oversight for payload CoFR and verification submittals
 - **Operations** – assist with operations issue resolution between the PD and the Increment Payload Manager; maintains payload insight; and coordinates payload resupply or return requirements; assure payload CoFR and verification submittals during payload lifetime on-orbit
 - **Post-flight** – coordinate vehicle deintegration requirements; return of payload material from the landing site to the PD; and Lessons Learned submittals



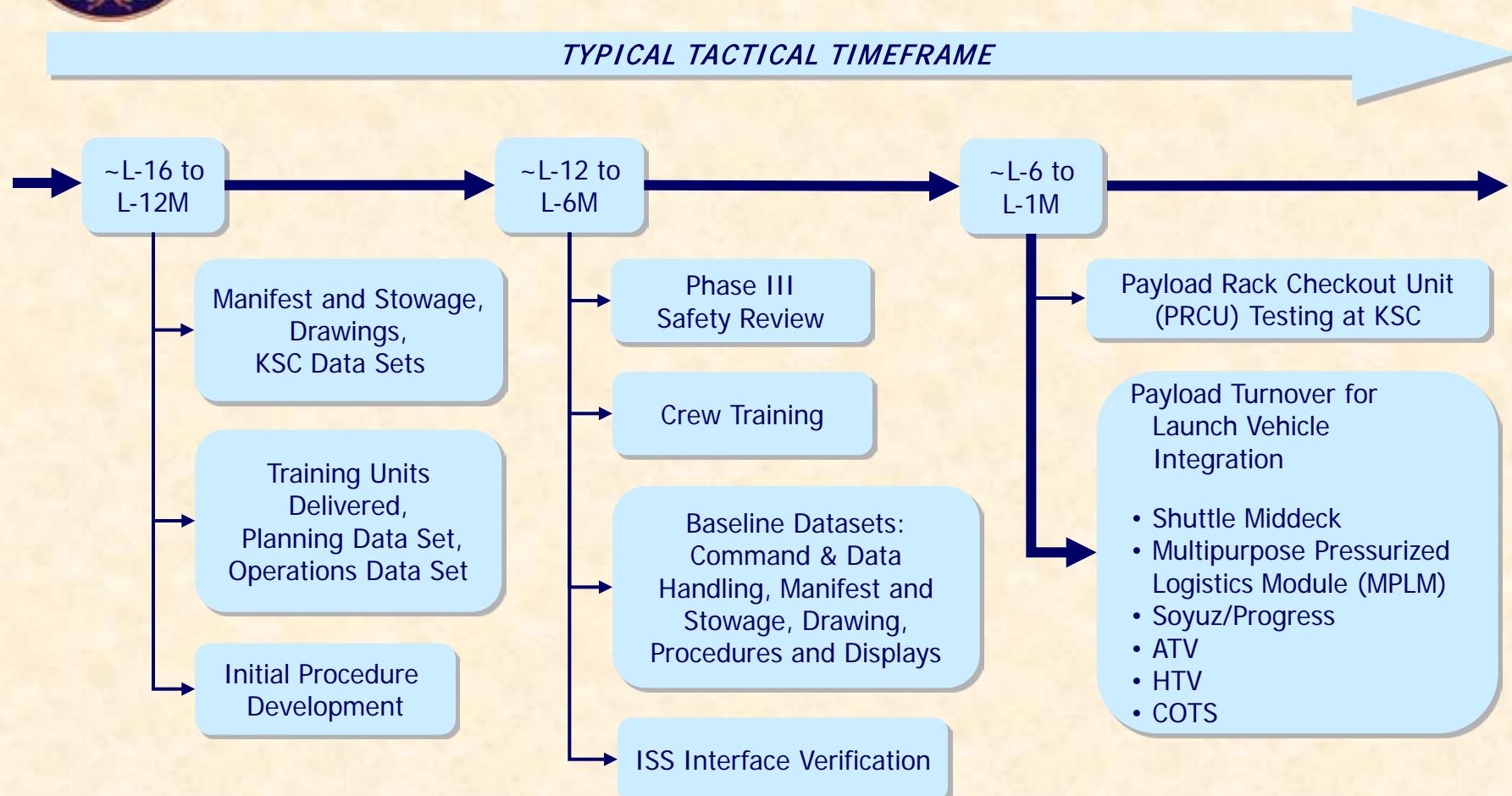
Strategic Timeframe Overview

TYPICAL STRATEGIC TIMEFRAME





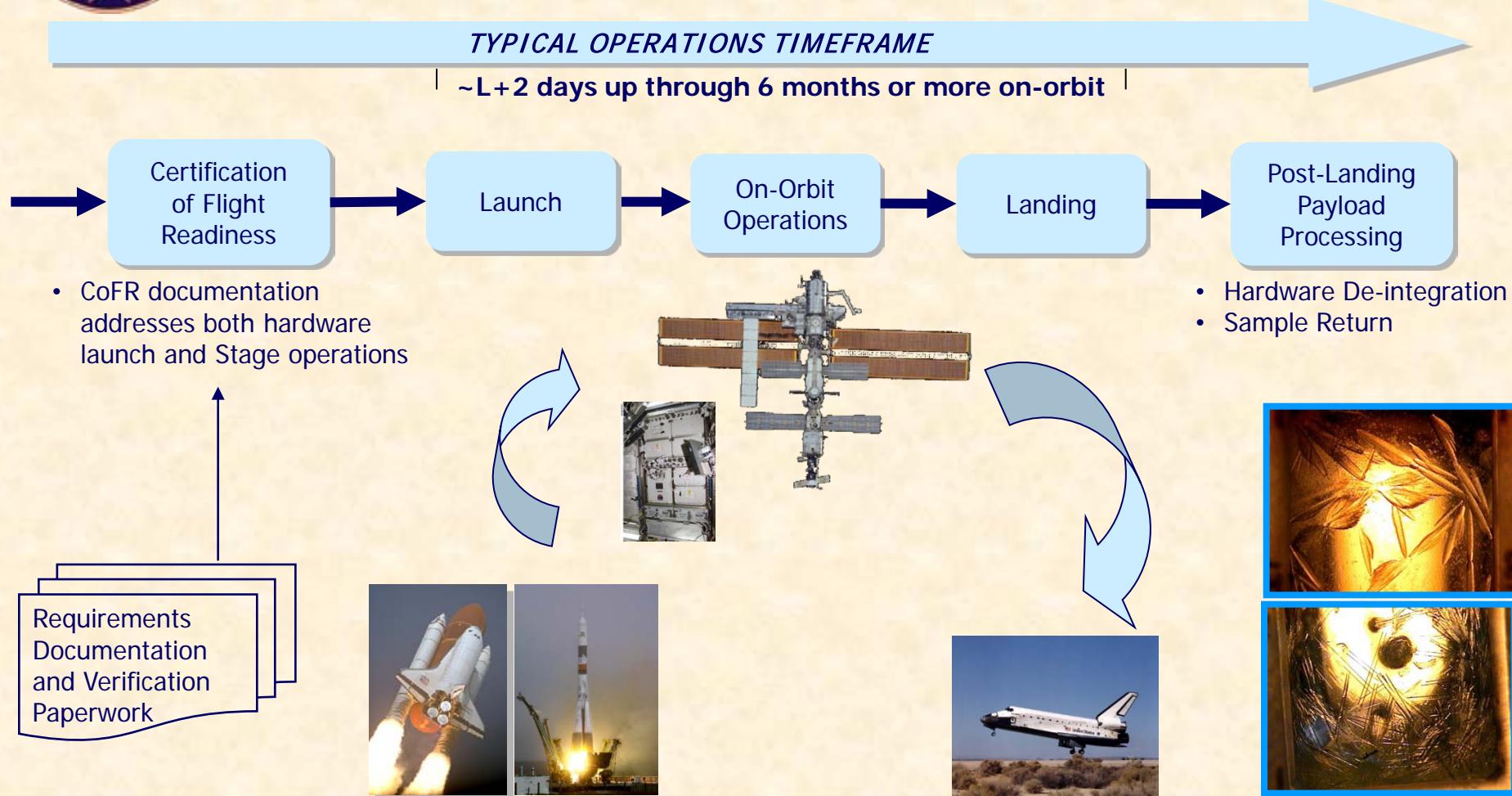
Tactical Timeframe Overview



Note: EXPRESS Sub-rack payloads will have a compressed integration cycle.



Operations Timeframe Overview





Joint Agreements

Negotiated Agreements

What they do for the Payload Developer

Strategic

Tactical

Unique PIA

Documents joint agreements to manage and execute roles and responsibilities for payload integration.

PIM Schedule

Documents negotiated product and hardware delivery dates.

Payload Unique ICD/
Verification Requirements

Defines payload hardware and software interfaces with ISS. Details interface verification requirements.

Payload Safety
Data Package

Documents payload hazards, hazard controls, and hazard control verification.

Payload Tactical Plan

Documents detailed payload resource requirements.

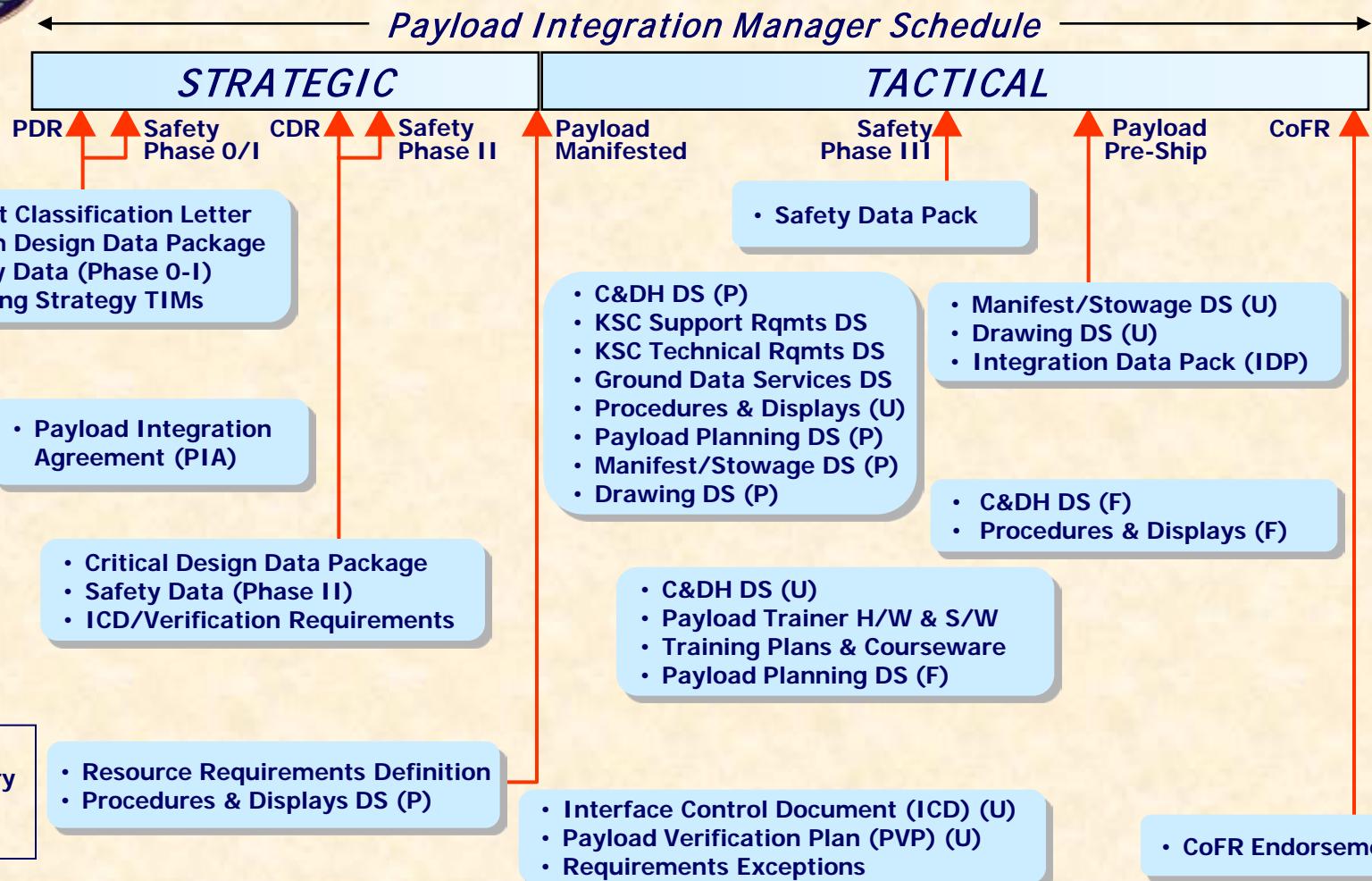
Payload Unique
Data Sets

Document detailed payload requirements for technical disciplines:

| | | |
|---------------------------------|--------------------------------------|-----------------------------------|
| • Payload Training | • Payload Operations | • EVA/EVR |
| • Ground Data Services | • KSC Support Requirements | • Payload Procedures and Displays |
| • Payload Planning Requirements | • KSC Technical Requirements | • Manifest and Stowage |
| • Command and Data Handling | • Payload Configuration and Drawings | |



Integration Products





Getting Manifested!





Payload Tactical Plan – IDRD Annex 5

- **Payload Tactical Plan – IDRD Annex 5**

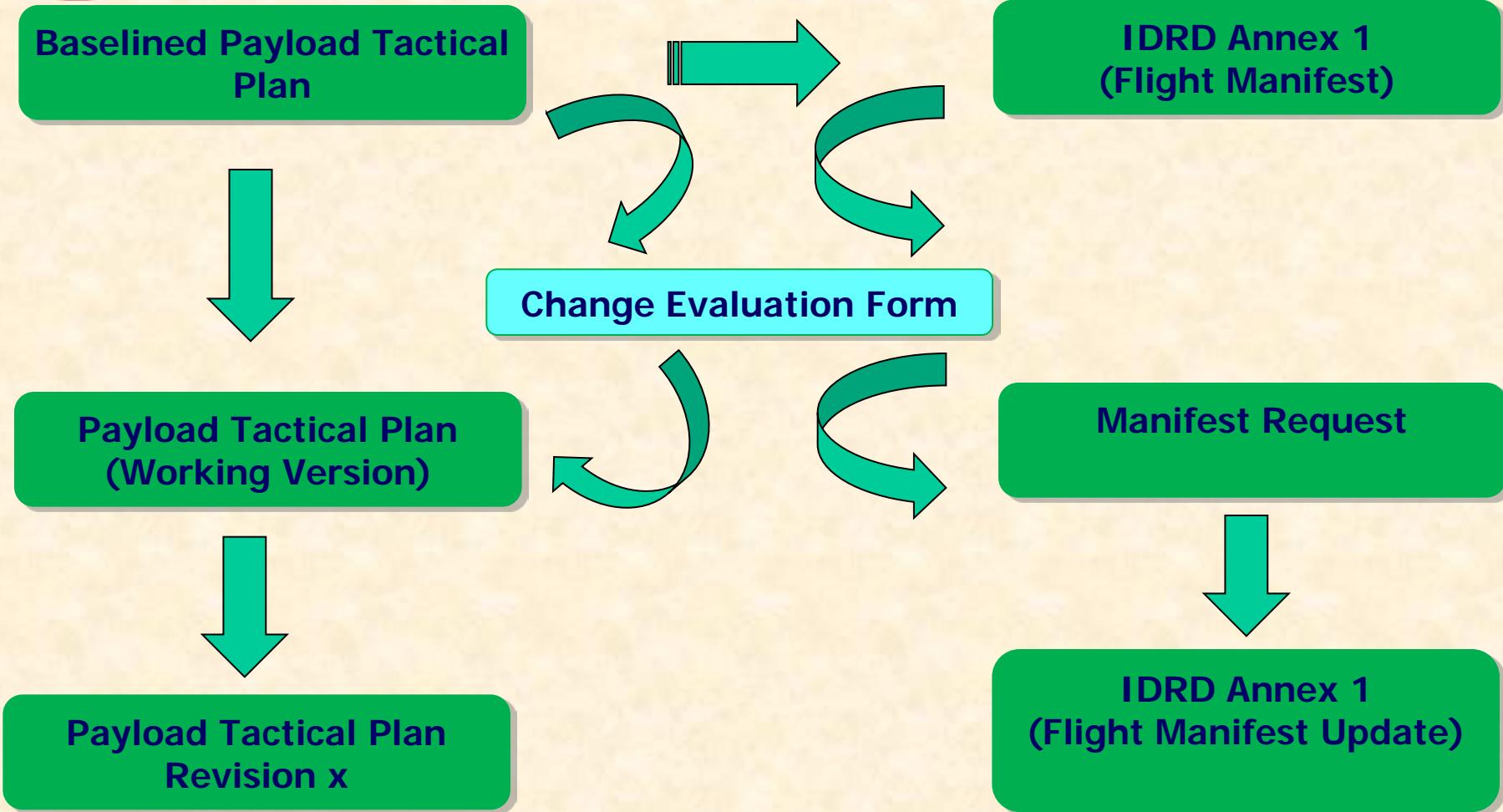
- Purpose:**

This document provides the integrated ascent, descent, and on-orbit resource requirements, research objectives , utilization priorities and on-orbit payload topologies of the utilization complement for a given set of Increments.

- The Payload Tactical Plan is used as a top level requirements document to define resource requirements which can then be flowed to downstream payload documentation (e.g. Hardware and Software ICDs, Procedures, Planning Data, Stage Analysis, etc.)**
 - The Payload Tactical Plan is also used to communicate utilization resource requirements to the other ISS offices (e.g. Mission Integration, Vehicle Office, MOD, etc.)**



Change Evaluation Form Process





Summary

- ◆ Our job is to increase the potential of Mission success for ISS payloads

Clearly defining and communicating requirements and expectations

leads to

Safe payload operations and successful research

resulting in

Maximum Science Return



ISS Payload Integration

Back-up Charts



ISS Payload Integration

Acronyms and Terms

ATV - Automated Transfer Vehicle

AWG - Acoustics Working Group

CDR - Critical Design Review

CoFR - Certification of Flight Readiness

C&DH - Command and Data Handling

DS - Data Set

EDMS - Electronic Data Management System

EEE - Electrical, Electronic, and Electromechanical

ExPRESS - Expedite the Processing of Experiments to Space Station

FLT - Flight

GSRP - Ground Safety Review Panel

HFIT - Human Factors Integration Team

H/W - Hardware

HTV-IIA - JAXA launch vehicle

ICD - Interface Control Document

IDP - Integration Data Pack

Inc - Increment

IP - Internet Protocol

IPLAT - ISS Payload Label Approval Team

ISS - International Space Station

JSC - Johnson Space Center

KSC - Kennedy Space Center

L-6 - Launch minus (*month or day*)

MPCB - Multilateral Payload Control Board

MPLM - Multipurpose Pressurized Logistics Module

MSFC - Marshall Space Flight Center

NPOCB - NASA Payload Operations Control Board

NSTS - National Space Transportation System

OpNom - Operations Nomenclature

PARC - Payload Activity Requirements Coordinator

PCB - Payload Control Board

PD - Payload Developer

PDL - Payload Data Library

PDR - Preliminary Design Review

PECP - Payload Engineering Control Panel

PIA - Payload Integration Agreement

PIM - Payload Integration Manager

PIMS - Payload Information Management System

PMIT - Payload Mission Integration Team

PODF - Payload Operations Data File

POIC - Payload Operations Integration Center

POIF - Payload Operations Integration Function

POIWG - Payload Operations Integration Working Group

PSCP - Payload Software Control Panel

PSRP - Payload Safety Review Panel

PVP - Payload Verification Plan

RPWG - Research Planning Working Group

SAR - System Acceptance Review

SR&QA - Safety Requirements and Quality Assurance

S/W - Software

TIM - Technical Interchange Meeting

TReK - Telescience Resource Kit

User-ID - User-identification

URC - User Requirements Collection

US PODFCB - US Payload Operations Data File Control Board

VPN - Virtual Private Network

IDRD - Increment Definition and Requirements Document

I-36M - Increment minus 36 months

L-6M - Launch minus 6 months

Increment - ISS period supporting crew rotation. The duration of an Increment is the time period from the launch of a designated Expedition crew to the undocking of the return vehicle for that Expedition crew.

Questionnaire - Web-based software data entry tool used to collect payload resource requirements in support of the RPWG manifesting process

Stage - ISS timeframe between manned vehicle dockings